Perfluoroalkyl Substances (PFAS) Induce Platinum Resistance in Ovarian Cancer by Improving Mitochondrial Membrane Potential and Mitochondrial DNA Copy Number

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PFAS, Female Reproduction, and Ovarian Cancer

- PFAS target various portions of the female reproductive tract\(^1,2\)
- Environmental exposures in relation to ovarian cancer and therapy response are understudied
- The majority of ovarian cancer patients will develop recurrent, platinum-resistant disease\(^3\)

PFAS Target Mitochondria to Induce Resistance

- At baseline, carboplatin decreases OVCAR-3 mitochondrial membrane potential (\(\Delta \Psi_m\))\(^4\)
- PFAS that induce platinum resistance also increase \(\Delta \Psi_m\), suggestive of improved mitochondrial functioning\(^4\)
- PFAS exposure leads to alterations, mainly increases, in mtDNA copy number in OVCAR-3 cells

PFAS Induce Platinum Resistance in Ovarian Cancer

- At baseline, OVCAR-3 cells are responsive to carboplatin\(^4\)
- Select PFAS and PFAS mixtures increase survival fraction in OVCAR-3 cells, indicative of platinum resistance\(^4\)

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References:
1Rickard et al. Toxicology (2021).

Funding Sources: National Institutes of Health (NIH), National Institute of Environmental Health Sciences (NIEHS) (ES007126, GM122741)

Acknowledgements: Curriculum in Toxicology & Environmental Medicine, UNC Certificate Program in Translational Medicine, UNC-NC State Joint Department of Biomedical Engineering